EUI WORKING PAPERS IN ECONOMICS

EUI Working Paper ECO No. 92/87

The Distribution of Income in Eastern Europe

ANTHONY B. ATKINSON
and
JOHN MICKLEWRIGHT

European University Institute, Florence

Please note
As from January 1990 the EUI Working Paper Series is divided into six sub-series, each sub-series is numbered individually (e.g. EUI Working Paper **LAW** No. 90/1).

EUROPEAN UNIVERSITY INSTITUTE, FLORENCE

ECONOMICS DEPARTMENT

EUI Working Paper **ECO** No. 92/87

The Distribution of Income in Eastern Europe

ANTHONY B. ATKINSON
and
JOHN MICKLEWRIGHT

BADIA FIESOLANA, SAN DOMENICO (FI)

Printed in Italy in June 1992
European University Institute
Badia Fiesolana
I–50016 San Domenico (FI)
Italy

THE DISTRIBUTION OF INCOME IN EASTERN EUROPE*

Anthony B Atkinson, London School of Economics

John Micklewright, European University Institute, Florence

and Queen Mary and Westfield College, London

May 1992

ABSTRACT

The paper is concerned with the distribution of household incomes in Eastern Europe before the economic transformation that began in 1990. Was there less inequality in these countries under Communism than in Western economies? If so, and if inequality can be expected to rise to Western levels with the economic transformation now underway, how large an increase in average income is necessary to compensate the bottom income groups? We present empirical evidence for four Eastern European countries: Czechoslovakia, Hungary, Poland, and the former USSR.

* Chapter to be published in *Industrial Concentration and Economic Inequality: Essays in Honour of Peter Hart*, edited by M Casson and J Creedy, and to be published by Edward Elgar. The chapter draws on material on the distribution of income in Eastern Europe described in more detail in Atkinson and Micklewright (1992). We are most grateful to the many people in Eastern Europe who made data available to us and provided information about sources. In analyzing and interpreting the data, we have been greatly helped by Gianna Gianelli, Joanna Gomulka, Denise Marchant, and Sheila Marnie.

1. INTRODUCTION

This chapter is concerned with the empirical study of the distribution of income, a subject which has been a long-standing concern of Peter Hart, and to which he has made notable contributions. In particular, we are concerned with the distribution of household incomes in Eastern Europe before the economic transformation that began in 1990. Was there less inequality in these countries under Communism than in Western economies? If so, and if inequality can be expected to rise to Western levels with the economic transformation now underway, how large an increase in average income is necessary to compensate the bottom income groups?

In the literature on Eastern Europe, one finds two distinctly different opinions about the Communist record. The first is that there was in fact no less inequality under Communism. For example, Lydall (1979) set the distribution of income in the United Kingdom alongside that in Czechoslovakia, Hungary and Poland. Comparing the percentiles of the distribution, and the Gini coefficient, he found for the early 1970s "little difference between the United Kingdom and this group of countries" (1979, p 33).

A similar conclusion was reached by Morrisson (1984) in a comparison encompassing a wider range of socialist countries, bringing in the former USSR, Bulgaria and Yugoslavia. Morrisson paid particular attention to the non-monetary advantages accruing to the privileged elite in Eastern Europe and included in his estimates are approximate adjustments. It is these adjustments in part which lead him to the finding that the income share of the top deciles were relatively similar in, for example, Czechoslovakia and the United Kingdom (UK). Even though the relative incomes of the lowest deciles (the bottom 4 deciles) are higher in Eastern Europe, Morrisson concluded that:

> "Czechoslovakia excepted, East European countries have *not* a more egalitarian income distribution ... all the other East European countries belong in the same range of income distribution as the most advanced of the Western countries" (Morrisson, 1984, pp 126-127).

The Gini coefficients for the individual distribution of household per capita incomes (that is, taking individuals ranked according to the per capita income of their household) were 22 percent for Czechoslovakia and 24 percent for Hungary, compared with 25 percent in Sweden and the UK. The Gini was 31 percent for Poland and the former USSR, compared with 30 percent in Canada and 34 percent in the US. (The data used by Morrisson relate mainly to the early or mid-1970s.) This assessment of income inequality in the former USSR

accords with the findings of Bergson that "Soviet income inequality probably has been found to be greater than often supposed. It is very possibly as great or greater than that in Sweden, and not much less than that in some other Western countries" (1984, p 1073).

On the other hand, there are those who find that income inequality was significantly less in Eastern Europe under Communism than in the West. McAuley (1979), on whose research Bergson drew, reached a rather different conclusion about the former USSR:

> "These estimates ... yield a value of 3.14-3.21 for the decile coefficient [ratio of the top to bottom decile], which implies that there is a moderately unequal distribution of incomes in the USSR. ... inequality in the USSR was less than in the United Kingdom and substantially less than in either the USA or Italy" (1979, p 66).

The estimates by Wiles (1978) of the per capita income distribution in the Communist countries of Bulgaria, Czechoslovakia, Hungary, Poland, and the former USSR show less inequality in Eastern Europe. His findings were summarised by the commentator on his paper as showing that

> "during the period considered, the USA and Canada had the most unequal distribution, followed by Italy, Sweden and the UK, with the socialist countries displaying the lowest inequality of this kind" (Michal, Discussion of Wiles, 1978, p 193).

This conclusion is in line with that of Pryor, who had earlier estimated that "the Gini coefficient of total income inequality is at least [ten percentage points] less in the East than in the West, other things remaining equal" (1973, p 88).

In this chapter, we present empirical evidence for four Eastern European countries: Czechoslovakia, Hungary, Poland, and the former USSR. (For convenience we refer usually to "Eastern Europe" and take this as including the USSR; on occasion, we refer to the first three countries as "Central European"). The choice of these countries is to a degree arbitrary, but the first three are fairly obvious choices, being the countries which are most advanced in terms of economic and political reform. The former USSR is too big to be ignored; and it is the country where the Communist experiment had the longest trial.

The sources of evidence used in this chapter on the distribution of income in Eastern Europe are described in Section 2. Many people appear to believe that no data exist on the distribution of income in Eastern Europe.

Such common impressions are, however, largely based on the situation in the former Soviet Union, where the distribution of income appeared next to alcoholism and drug addiction in the censor's list of prohibited subjects, but the position in the Central European countries has been quite different. There have been regular household surveys, and a considerable volume of distributional information has been published.

The evidence about the distribution of income in Eastern Europe in the mid-1980s is presented in Section 3. This period is chosen as one for which data are available, including information for the USSR, and which is at the same time less affected by the changes which took place towards the end of the decade (such as the wage reform initiated by Gorbachev). The degree of income in equality in Eastern Europe is compared with that in the UK. It would be desirable to make comparisons with a wider range of Western countries, including those at a similar stage of development, but for the present we confine the comparison to the Western country we know best. (For a recent comparison involving the Netherlands, rather than the UK, see Bruinooge et al, 1990.)

In drawing attention to the availability of evidence on income inequality in Eastern Europe, we are not suggesting that such data are perfect. The household surveys, particularly that in the former USSR, are subject to a number of qualifications. The limitations of the evidence are the subject of Section 4. The main conclusions are summarised in Section 5.

2. DESCRIPTION OF THE DATA

Many people believe that under the Communist regimes of Eastern Europe little information was made available about the distribution of income. According to this view, the claims of socialism to have reduced income differentials or to have abolished poverty could not be assessed because of the absence of statistical data. Summarising the situation in his 1984 survey article, Bergson concluded that "the Soviet government apparently prefers to withhold rather than to release information" (1984, p.1091). It would however be wrong to suppose that the situation in the USSR was representative of Eastern Europe as a whole. In Czechoslovakia, Hungary and Poland, there has been a long tradition of collecting and publishing data on the distribution of income. In a number of respects the availability of data in these countries before 1990 compares favourably with that in Britain. And the situation has changed dramatically with *glasnost'* in the Soviet Union, where information is now available about the distribution of household incomes in the 1980s (see for example Ellman, 1990).

The second common belief about data on the distribution of income in Eastern Europe is that they are of poor quality. It is thought that the low priority attached to distributional issues led to inadequate resources being allocated to statistical activities. It is alleged that the relation between Communist governments and individual enterprises, and that between the state and its citizens, was not such as to induce accurate reporting. But it is important to judge the quality of data, not by some ideal standard, but by the standard of what can realistically be achieved. All data are imperfect to some degree. Even the best designed survey has problems of incomplete coverage, of non-response or partial response, and of ambiguity in the interpretation of definitions. There are, even with best-practice statistical techniques, difficulties in grossing-up survey data to be representative of the population as a whole and of reconciling the findings with aggregate statistics.

The main features of the statistical sources on income distribution used in this chapter are summarised in Table 1. (More details are given in Atkinson and Micklewright, 1992.) As is made clear in the final column, published information relating to the distribution of household income in the Communist period may be found in the annual statistical yearbooks. For example, a quinquennial household income survey was first held in Hungary in 1963, with some limited results published in the 1964 yearbook. A special

English language publication was produced giving results of the 1973 survey (Hungarian Central Statistical Office, 1975).

Turning to the UK, we may note that, in contrast with Hungary, Britain has not to date had a regular purpose-built household survey specifically designed to produce information on the distribution of income in the population as a whole. Evidence about the distribution of household income has been obtained from sources whose main purpose is different. The first of these is the income tax records, which are the basis for the Survey of Personal Income (SPI) carried out each year by the Inland Revenue. This however excludes a substantial part of the non-tax-paying population -- several million pensioners and others not at work -- and does not cover non-taxable income, particularly certain social security benefits such as child benefit. It is not therefore on its own a satisfactory source. For this reason, the official estimates of the overall distribution have been based on a combination of information from the SPI and the annual Family Expenditure Survey (FES). These estimates are referred to as the Blue Book estimates, since they used to be published in the National Income Blue Book. However, the methods by which these estimates are constructed means that they cannot be put in a form comparable with the Eastern European data. In particular, they cannot be used to derive a distribution by *households*, rather than tax units, and they cannot be expressed on a *per capita* basis. For this reason, we rely on the information on the distribution of income provided by the Family Expenditure Survey (FES), using the basic micro-data tapes.

Survey design

In terms of survey design, the odd one out in Table 1 is the former USSR. In contrast to standard household survey methodology in the West, which samples on a geographic basis, the point of departure for household income data collection in the Soviet Family Budget Survey (FBS) has been the enterprise: the sampling unit has been employees at their place of work. The survey has been a quota sample of families of persons working in state enterprises and collective farms. This meant that households without employed members were not normally included, although some "pure" pensioner households have in fact been covered in recent years. Moreover, the quotas in the sampling process have meant that employees in heavy industry, and hence the urban population, appear to be over-represented. The survey is a panel, respondents being pressured to co-operate indefinitely, and this has further

implications for the representativeness of the data. The sampling design is one important reason why the FBS has attracted substantial criticism both inside and outside the Soviet Union. Shenfield argues that Soviet planners and academic researchers where possible avoid the FBS and concludes that

> "the sample is subject to a great many different biases, often severe and cumulative in effect, and that the survey is highly unrepresentative of the population as a whole" (1984, p 3).

McAuley (1979) argues that "statistics from this source have been rejected by many, perhaps a majority, of Soviet economists and statisticians as worthless" (p 51), but goes on to note that it represents the only source of information on a number of questions. It is in this spirit that we use the Soviet FBS here, returning to the deficiencies in Section 4.

The position is quite different in the other Eastern European countries. In contrast to the methodology described in the USSR, the household surveys used here for Czechoslovakia, Hungary and Poland were all conducted on a geographic basis: in these countries the dwelling, and not the worker, was the sampling unit. For example, the sampling frame for the Czechoslovak Microcensus in 1988 was a centralised administrative register used to record addresses of all dwellings so as to collect a combined payment for gas, electricity and other utilities. This seems broadly comparable to the Postcode Address File used since 1986 in the UK FES.

The planned coverage of the population by these surveys was reasonably complete, but certain categories of households were specifically excluded from the household surveys. This applied in Czechoslovakia and Poland to households with members in the army or the police. Our understanding is that households of members of the government or senior Communist Party officials were not in general excluded deliberately. In Poland a significant exclusion was of all households in which the main employment was the private non-agricultural sector, about 10 percent of the labour force. All of the surveys, including the FES in the UK, exclude persons living in institutions.

Response rates

The achieved samples in the household surveys have been large: about 20,000 households in Hungary, 30,000 in Poland, 60,000 in the USSR (90,000 from 1988) and 100,000 in Czechoslovakia. These may be compared with a sample size in the UK of only some 7,500 households in the FES. It is true that the other main source of data used to give information in the UK on the

distribution of income, the Survey of Personal Incomes has a sample size of about 125,000 but this is based on a sample of tax records and is not a household survey.

The response rate to the survey by sampled households is also critical. To put the Eastern European surveys in perspective, it is useful to note that the overall level of response in Britain to the FES has typically been around 70 percent of the effective sample. By this yardstick, the success of the periodic Czechoslovak Microcensus and the quinquennial Hungarian income survey was excellent: response to the former in 1988 was 97 percent and to the latter was 91 percent in 1982 and 83 percent in 1987. In contrast, response in the 1980s by households first selected for the Polish budget survey (the survey has a rotating panel design) was at or below the level of the British FES, averaging 65 percent during 1982-89, but with more variability, ranging from 71 percent in 1983 to only 58 percent in 1989. We have been unable to establish the extent of non-response to the Soviet family budget survey. Soviet statistical service (Goskomstat) officials denied to us that non-response was a problem, but Boldyreva argues that it is difficult to get "deviant" families to participate (1989, p 91).

Verification of data

Considerable effort in Eastern European surveys went into the collection of income data. In all four countries, earnings data provided by respondents were verified with their employers. A great deal of care appears to have been taken: for instance, in the Hungarian Income Survey where job changes had taken place during the year, the information was requested from each employer. In the Czechoslovak Microcensus, information on pensions was collected from post-offices.

In the UK, the FES relies solely on information supplied by the respondents themselves. The survey officers do not ask respondents to give the names of their employers so that earnings data can be verified, nor does the survey have access to administrative records on social security payments. In the case of earnings, respondents are asked to verify their replies from wage slips and 70-80 percent of them do so.

Second economy

A significant amount of income from second economy jobs and other activities, legal or otherwise, may be missing from household surveys, and

this may be much more important in Eastern Europe than in the UK. The growth of the second economy in Hungary has been referred to by many authors (for example, Éltetö and Vita, 1989). There are reports of large increases in the USSR (Alexeev and Gaddy, 1991, p.20). In Poland, an important source of income for many households appears to have been transfers of hard currency from relatives working abroad.

The coverage in household surveys of income from outside the official economy is a contentious subject. Writers on Eastern Europe often express concern that the recorded incomes refer only to 'official' income and that 'black economy income' does not enter the data concerned. However, the notion that black economy income is *by definition* missing from Eastern European household surveys is in our view incorrect. Our interpretation of the relevant questionnaires, based on discussions with the statistical offices concerned, indicate that a respondent wishing to report all income, legally or illegally obtained, in general had the opportunity to do so without penalty. Of course, the *success* achieved in soliciting information about second economy income, legal or illegal, is a matter for real debate. In pointing to attempts by statistical offices to collect data on "illegal" income, we are not arguing that this was carried out in full. In the case of the USSR, a former member of the Soviet statistical service reported that

> "people with considerable concealed income refuse to take part in the survey. They are afraid that the rule of confidentiality will not be respected, and justifiably so, because survey staff are not in a position to guarantee confidentiality. If, say, the KGB asks then for information, TsSU [the name of the Soviet statistical service at that time, forerunner to Goskomstat] has no right to refuse" (quoted in Shenfield and Hanson, 1986, p.64)

Official estimates put aggregate illegal income in the USSR at some 9 percent of GDP with about 40 percent of this being derived from the illicit production of alcohol but almost none coming from unlicensed work, which hardly seems credible (*Vestnik statistiki*, 1990, no.6). Other estimates are significantly higher. Estimates based on a sample of Soviet emigrés suggest that up to a third of the urban population's income came from illegal sources (Grossman, 1987).

The under-reporting of second economy income is a serious qualification of the distributional estimates for Eastern Europe. In Section 4, we refer to some of the attempts which have been made to allow for its effect. It

should however be noted that the problem of under-reporting is not absent in the UK, where there is, for example, concern about the accuracy of recorded self-employment income.

Time period

The data in Eastern Europe refer to *annual* income, whereas those in the UK refer to a variety of periods depending on source. The UK data presented here are probably best interpreted as *current* income, and as such may be expected to be more variable owing to changes in family status, wages and employment over the year. On the other hand, an important source of income variability in Britain, that stemming from unemployment, was largely missing in the pre-reform period in Eastern Europe. This means in turn that, if we were to seek to standardise the time period, it would make a difference whether we took the week/month or the year as the common basis. If there were less monthly variation in Eastern Europe, then the move to a monthly assessment period would not greatly change the measured inequality; but standardisation on a year could significantly reduce the measured inequality in the UK.

Presentation of results

The data for Eastern Europe relate to the distribution of income by *households*, and this is the unit of analysis adopted here. This leads in turn to the question as to how each unit's income is adjusted to take account of differences in unit size. The standard practice in Eastern Europe, and that followed here, is to calculate *income per capita*. This practice is easy to carry out and to explain. It is however different from that in the UK, where no official statistics have been published on a per capita basis. Indeed the main official figures, the Blue Book estimates, make no adjustment at all for the size of the income unit.

3. DISTRIBUTION OF HOUSEHOLD INCOMES

In this section we consider the evidence about the distribution of net household income in the five countries in the mid-1980s. In Table 2, we show data for 1985 in Czechoslovakia, Poland and the USSR, and for 1982 in Hungary. The estimates all relate to the *individual distribution of household per capita income*. In each case, the official data come in tabulated form and we have typically had to interpolate within ranges to arrive at estimates of the quantiles, quantile shares, and summary statistics of the distribution. (Details of the interpolation methods are given in Atkinson and Micklewright, 1992, Sources and Methods.) The official statistics do not present data in Britain in per capita terms; for this reason we have given our own calculations for the per capita distribution in the UK based on the original micro-data. The Czechoslovak data exclude the value of income in kind, including that from agriculture, whereas an estimate of the latter is included in the data for the other countries.

If we look first at the percentiles, we find that Czechoslovakia has the least inequality. The bottom decile in Czechoslovakia has an income which is 66 percent of the median, compared with 62 percent in Hungary, 58 percent in Poland, 54 percent in USSR and 52 percent in the UK. The lower quartile follows the same ranking, with Czechoslovakia and Hungary relatively close: 81 and 80 percent, respectively, compared with 72 percent in the UK. Above the median, Czechoslovakia and Hungary appear to be grouped together as exhibiting the least inequality. Poland and the USSR appear to form a second group, with a marked difference in the upper part of the distribution between these countries and the UK. The top decile in Poland is 175 percent of the median, in USSR it is 178 percent, but in the UK it is 201 percent. Overall, the position is summarised clearly by the ratio of the top to bottom decile, referred to as the decile ratio (and rounded to one decimal place):

Czechoslovakia	2.4
Hungary	2.6
Poland	3.0
USSR	3.3
UK	3.9

The distribution of income is more commonly presented in terms of *shares of total income*, which are the ingredients for drawing the Lorenz curves. In the lower part of Table 2, we show the cumulative income shares, with S_x denoting the share in total income of the people who make up the bottom x

percent. The share of the bottom 10 percent is estimated to be 4.9 percent in Czechoslovakia and Hungary, compared with 3.5 percent in the UK. (Poland and the USSR hold an intermediate position.)

Looked at from the point of view of the bottom 10 percent in the UK, this means that a switch to a "Czech/Hungarian" *distribution* of income would yield the same cash advantage as a 40 percent increase in *average* income with the distribution remaining unchanged. Moving up the cumulative distribution, the share of the bottom fifth is 11-12 percent in Czechoslovakia and Hungary, compared with 8½ percent in the UK. The 'advantage' of the more equal Czech distribution is in this case equivalent to a difference of about 35 percent in average income. This is shown graphically in Figure 1. On the vertical is shown the increase in average income which would be necessary to compensate the bottom x percent for a move to a UK distribution of income, for different values of x from 10 to 50. In the case of the bottom 30 percent in Poland, for example, a rise of 13 percent in average would be necessary to compensate for a move to the UK distribution.

The fact that the shares S_x are in each case higher, or no lower, for Czechoslovakia than for Hungary means that the Lorenz curve lies nearer to the line of equal incomes. (We do not actually draw the Lorenz curves, since the differences can be seen clearly from Table 2.) This applies right up the income scale: the share S_{90} is 82.1 percent in Czechoslovakia, compared with 81.4 percent in Hungary, which means that the top 10 percent in Czechoslovakia have a share of 17.9 percent, compared with a share of 18.6 percent in Hungary. (Whether or not this, or other, differences are statistically significant is a question that requires information about the standard errors surrounding these figures.)

The Lorenz curves may be used to compare other countries. The curve for Hungary lies inside that for Poland, the USSR, as well as the UK. The curves for Poland and the USSR in turn lie inside that for the UK. With a sole exception, we have a situation of "Lorenz dominance", where when comparing two countries we can say for one of the two counties that the bottom x percent have a larger (or no smaller) share whatever value of x we choose. The exception -- where the Lorenz curves cross -- concerns Poland and the USSR. For shares up to S_{70}, Poland does better, but S_{80} and above are higher in the USSR.

Measures of inequality

A quantitative indication of the extent of differences in the income

distribution can be provided by a measure of income inequality. The use of such measures does however involve, explicitly or implicitly, judgments about the weight to be placed on different parts of the distribution. It is interesting therefore to note the differences in the measures used in different countries.

A favourite in many countries is the Gini coefficient. From Table 3, we can see that the Gini coefficient is 20 percent in Czechoslovakia and 30 percent in the UK. Between these two countries there is indeed the ten percentage point difference found by Pryor (1973, p 88). Nor is Czechoslovakia exceptional, as some writers have suggested. The Gini coefficient for Hungary is nine percentage points less than that in the UK. It is only for Poland and the USSR that the difference from the UK is reduced to four percentage points.

Statisticians in Eastern Europe have tended to emphasise other measures of inequality. The "maximum equalisation percentage" made popular by the UN Economic Commission for Europe (1967, Chapter 6) has been used extensively in Poland. It involves taking those decile groups whose share exceeds 10 percent and adding the excess of these shares over that level. For 1985, we have (see Table 2) the following:

	share	contribution to maximum equalisation percentage
7 decile	10.6	0.6
8 decile	12.0	2.0
9 decile	14.1	4.1
10 decile	21.1	11.1

so that the total value of the index is 17.8. The index approximates the share of total income which has to be taken from those above the mean, and transferred to those below the mean in order to achieve equality. (It is an approximation since it is based on data grouped by deciles.) Algebraically, it is half the mean deviation divided by the mean. Here, in view of its simple interpretation, we refer to it as the *Robin Hood Index* (RHI). From Table 3, it is clear that Robin Hood would have less work to do in Hungary and Czechoslovakia and quite a lot more work in the UK, where he would have to transfer 21 percent of total income.

The Hungarian statistical office has used a variation on this measure of inequality: the ratio of average income above the mean to average incomes below the mean (see Éltetö and Frigyes, 1968). (The relationship between this

measure and the Robin Hood Index changes as the proportion of the population above the mean changes.) The values of the *Hungarian Inequality Measure* (HIM) are shown in Table 3. In the UK the average income of those above the mean is 2¾ times that of those below the mean, which is quite a lot higher than in Poland and the USSR where the ratio is double. In Hungary, the value is 1.8, and Czechoslovakia has again the least inequality, with a value of 1¾.

Peter Hart has argued forcefully (eg in Hart, 1978) for preferring *parametric* estimators of inequality to the non-parametric induces used so far in this section. As he notes,

> "if an income distribution approximates a standard theoretical statistical distribution, the choice of inequality measure is considerably simplified because we can use the estimated parameters of the theoretical distribution" (1981, p. 3).

As in his work, we have used the lognormal distribution. First, we plotted the cumulative distributions on log probability paper (ie plotting log income against a normal probability scale), which "although [it] can hardly be regarded as a rigorous statistical test of lognormality ... nevertheless provides a quick method of judging whether the population may feasibly be lognormal" (Aitchison and Brown, 1957, p. 32). If the distribution were lognormal, this procedure would yield a straight line graph. The approximate linearity in our plots suggested that the lognormal provided a reasonable fit, judged by eye, for the fifth to ninety-fifth percentiles in Hungary, USSR, and UK, but that there was a slight perceptible upward curve in Czechoslovakia, and that the fit was less good in Poland. Secondly, we obtained an estimate of the variance of logarithms from the ratio of the (interpolated) eighty-fourth and sixteenth percentiles. (The estimated standard deviation is equal to half the natural logarithm of the ratio -- see Aitchison and Brown, 1957, p. 32.) The resulting estimates of the variance of logarithms are shown in the final column in Table 3. Again there appear to be three groups: (a) Czechoslovakia, followed by Hungary, with the lowest variance, (b) then Poland and the former USSR, although with a more noticeable gap between them, and (c) finally the UK with the largest estimated variance.

4. LIMITATIONS OF THE EVIDENCE

The conclusions drawn from these statistics may change when we take account of the deficiencies of the data. In Section 2, and in Atkinson and Micklewright (1992), we have described the sources of data on household incomes and indicated some of their limitations. As emphasised there, all data are imperfect, and one advantage of the comparative perspective is that it allows us to see how the shortcomings of the Eastern European data compare with those of Western data. At the same time, it should be remembered that it is not just *differences* in methods of collecting data that may cause problems. It is also the case that statistical deficiencies which are common to East and West may have different implications on account of the social and economic differences. Household budget surveys exclude the homeless, an omission which is more significant in some countries than others. Inadequate coverage of income from the underground economy is likely to be more important in Eastern Europe. The omission from income data of capital gains is more serious in Western countries with substantial private ownership of capital and land.

One major reference point in assessing the quality of the data has been comparisons with the national accounts. In the case of the USSR, Alexeev and Gaddy (1991), drawing on work by Treml (1990), have compared the aggregate incomes of several types recorded in the Family Budget Survey (FBS) with those shown in national accounts. The differences were an over-statement of 11 percent of state wages and salaries, and of 6.5 percent of collective farm pay, and an under-statement of 10 percent in state transfers. Alexeev and Gaddy argue that these figures "conclusively demonstrated the unrepresentativeness" (1991, p 22).

These discrepancies should however be compared with those found in Western sources. In the case of the Family Expenditure Survey (FES) data from the UK, we have investigated the divergence between income aggregates recorded in the survey for the years 1970-77 and those shown in the national accounts (Atkinson and Micklewright, 1983). The results from this exercise for 1977 show a shortfall for earnings in the FES of 6 percent, a figure which is described in the official FES Report (Central Statistical Office 1989, p v) as indicating that earnings in the survey are "slightly deficient". For social security benefits, the deficiency was 9 percent -- a figure very similar to that quoted for state transfers in the USSR Family Budget Survey. When we come to income from self-employment and occupational pensions, we find that there is a shortfall of around one quarter, and for investment

income as much as one half of total income appears to be missing from the FES.

The fact that such large income shortfalls should be observed in the UK FES, a survey which is widely recognised within the UK and elsewhere to be of a high standard, leads us to be cautious in reaching critical conclusions about the data for Eastern Europe. We find relatively reassuring the finding that per capita personal income recorded in the 1987 Hungarian income survey was 96 percent of that indicated by aggregate sources (*Statistical Yearbook*, 1988, p.427). Similarly, we were told that per capita money income in the 1988 Czechoslovak microcensus was 86 percent of that suggested by aggregate data but that at least half the shortfall could be attributed to differences in definition, something which we found to be important in the comparison of the UK FES with the national accounts (and which has been allowed for in the comparison quoted).

At the same time, there are clearly weaknesses in the available household income data. Here we concentrate on those which may have caused inequality to be *under*-stated in Eastern Europe, and those which may cause inequality to be *over*-stated in the UK.

Sample design

The first reason for under-statement of inequality in the USSR is the problem of the sample design. As a result of the way that the sample is drawn for the Soviet FBS, there can be no doubt that the survey is unrepresentative. The under-representation of pensioner households may be expected to cause inequality to be under-stated, although this under-representation may be less serious in the 1980s than in the past. A second major problem is that the panel nature of the FBS leads it to be unrepresentative of the working population, in that it is biased towards those with longer service records. This again may cause inequality to be understated.

In the three Central European countries, the sample design is comparable with that in the UK, except for the exclusion in Poland of households whose principal source of income is the private non-agricultural sector. The latter exclusion may cause inequality to be under-stated. Differential non-response, in all three countries, may have the same effect: for example, there are signs that response is lower in large cities, where there may be more of both high- and low-income households. It should be noted that the level of response is

different across countries and that in the case of Poland non-respondents were substituted with other households with similar characteristics.

Missing income

Among respondents there is a problem of incomplete reporting or coverage of income. The incomplete coverage of agricultural production affects Eastern Europe to a greater degree than the UK. In the case of Czechoslovakia, the distribution examined here does not include the value of farm production for own-consumption. This may cause the degree of inequality to be over-stated insofar as this source of income is proportionately more important at the bottom of the scale. In the case of the other Eastern European countries, an estimate of this income is included but there are issues concerning the valuation of output. The use of state prices for farm produce may cause incomes such as those of collective farm workers in the USSR to be under-stated.

One of the most important problems is the omission or under-recording of income from private business activity, illegal activities and from overseas remittances. Assessing the possible effect of unrecorded incomes on the *distribution* of income is a daunting task. An impressive attempt to do so is the study for Hungary by Éltetö and Vita (1989). They took as their starting point the microdata in the 1982 Hungarian income survey. The survey sample for this year was divided into 71 sub-groups on the basis of sex, occupation and type of residence, and the individuals in each were subjected to a separate micro-simulation treatment in respect of "hidden" income, defined by the authors as "unauthorized and/or tax-evading productive and service activities, tips, gratitude payments" (1989, p.4). This simulation increased the incidence and/or recorded amounts of hidden income in each sub-group, with for example high values of these parameters for doctors, dentists, hairdressers and beauticians living in Budapest. Within each group simulated amounts of hidden income for each individual were drawn from a lognormal distribution. The recorded data in the 1982 survey indicated that these forms of income accounted for only 2 percent of personal income. Éltetö and Vita experimented with three different assumptions increasing the proportion of hidden income in "low", "medium" or "high" variants to 6, 8, or 11 percent respectively. The effect of the simulations were to increase inequality of incomes; we estimate from Éltetö and Vita's results that the decile ratio rose after adjustment from 2.6 to 2.9 under the "high" variant. Referring back to

Table 2, we can see that, even taking the "high" variant, and even supposing no upward adjustment to be necessary to be the UK figures, there remains noticeably less inequality in Hungary. (The UK decile ratio is 3.9.) The results from this exercise cannot of course be seen as necessarily representative of the impact of under-recording of income in Central Europe. However, certain aspects of the Hungarian situation may be applicable, and it gives an impression of the possible quantitative impact. In the case of the USSR, there has been debate as to the distributional impact of illegal incomes. It has been suggested that illegal earnings in different jobs were inversely related to the official rates of pay. Alexeev and Gaddy make use of data for a sample of some 1,000 families which emigrated from the USSR to the United States in the late 1970s and early 1980s. The results show that the Gini coefficient for total income from all sources, legal and illegal, was only 1 percentage point higher than that for legal incomes for those coming from Russia, Belarus, Ukraine, Moldavia and the Baltic republics, but that it was 7 percentage points higher for those from the Transcaucasus and Central Asian republics (Alexeev and Gaddy, 1991, Table 5.1). It should be noted that the results are based on a small and largely urban sample.

Non-monetary privileges of the elite

One of the features of the former USSR that has attracted considerable Western attention is the provision of substantial benefits in kind to a small "elite" group of *nomenklatura*: top Party and government officials, army officers, managers, scientists, academics, etc (see, for example, the study by Matthews, 1978). These included the provision of superior housing, provision of cars and chauffeurs, holiday homes (dachas), access to foreign currency for travel, access to foreign currency shops where imported goods could be purchased, etc. At the same time, non-cash benefits are not limited to the elite, and the more evident privilege at the top should be seen as part f structured pattern of differential remuneration. Particularly in the USSR, the "quality" of the enterprise one worked for was a most important determinant of living standards independent of the level of earnings.

What is the likely impact of such benefits in kind on the degree of income inequality in Eastern Europe? One brave attempt to estimate the effect of benefits for the nomenklatura was that of Morrisson (1984). He started from estimates for the size of the "privileged" population varying from 0.2 to 1.5 percent in the USSR and of 0.7 percent in Poland. As has been

noted by several writers, adjustment for the missing income of a group of this size would not affect the estimated decile ratio or other percentiles below the elite group. (These measures *would* of course be affected by more generally distributed non-wage benefits received by those lower down the distribution.)

The shares in total income and the Gini coefficient would however be affected. In order to show what he believed to be the *maximum* impact of special advantages of the 'privileged', Morrisson made an adjustment to the data on household income distribution for a number of Eastern European countries, including the four we considered here, by assuming that these advantages in every country represented at most half the recorded income of the top 5 percent of the distribution. Summary inequality measures of the income distribution were then estimated for each country with and without the adjustment for top incomes. In between these, Morrisson argued, "the true distribution certainly lies" (1984, p.126).

To treat the elite population as being as extensive as the top 5 percent seems to be casting the net wide. In contrast, Bergson (1984, p. 1070) took the elite population as 0.3 percent of the urban population, and Morrisson himself referred to 1½ percent (1984, p. 126n). Here we present an alternative calculation, taking the latter figure to represent the elite population, and asking how large the payments to the top 1½ percent would have to be for the Gini coefficient in Eastern Europe to be equal to that in the UK in 1985 (29.7 percent). It should be borne in mind that this can only be an approximate calculation since we are interpolating in an open upper interval to arrive at the share of the top 1½ percent. (Also, since this is only an illustrative calculation, we use the linearised Lorenz curve drawn in terms of deciles to calculate the Gini coefficient.) The calculation shows that the increase in their income necessary to raise the Gini coefficient to the UK level would be around 125 percent in the USSR and Poland: ie we would have to more than double the income of the top 1½ percent. In the case of Hungary, the income of the top 1½ percent would have to be multiplied by a factor of some 4½; for Czechoslovakia it would require a factor of 5. This calculation is clearly arbitrary, and attributes no value to what may admittedly be the lesser but nonetheless widespread non-wage benefits received by those at lower points of the income distribution.

In the West, these benefits in kind are referred to as "fringe benefits", but this should not be taken as meaning that they are necessarily

small in scale or extent. Indeed, in a country such as Britain, minor 'perks' or better working conditions associated with better paid jobs are so widespread as to scarcely warrant mention. Substantial benefits are available to top managers in the private sector. Obtaining quantitative evidence about the scale and distribution of payments in kind is not easy. In Britain, the Royal Commission on the Distribution of Income and Wealth (1979) distinguished between "welfare" benefits, generally available to all employees in a firm, including free or subsidised meals, sports facilities, and goods at discount prices, and benefits intended to attract and retain staff, particularly executives, which were concentrated at the top end of the earnings scale. The survey evidence quoted by the Commission showed 67 percent of executives with full use of a company car, 62 percent with free life assurance, 44 percent with free medical insurance, and 10 percent with low interest loans (1979, Table 9.9). The overall conclusion of the Royal Commission was that

> "there is little doubt that if account were taken of employee benefits, working conditions and other aspects of employment, the dispersion of the earnings distribution would be increased. The effect within the top one per cent of employees must be particularly marked." (1979, p 233).

The United Kingdom data

There are also factors which may cause the degree of inequality in the UK to be over-stated. The measurement of income over a week or month may lead to a higher recorded degree of inequality than annual income. Estimates of the possible effect have been made by Nolan using the same data source as in Table 2, but for the earlier year of 1977. The effect on the inequality of pre-tax income is to reduce the Robin Hood Index from 24.9 percent to 24.2 percent (1987, Table 5.1 p 71). On this basis we could account for only a modest part of the difference. Moreover, against this must be set a number of factors which may cause inequality to be under-stated in the UK. These include the lower response of the self-employed to the FES, the tendency for self-employment and investment income to be under-stated, and the omission of fringe benefits already discussed.

5. CONCLUSIONS

The aim of this chapter has been to summarise the evidence about the distribution of household income in three countries of Central Europe and the former USSR, compared with the United Kingdom. The evidence refers to the mid-1980s, and it should be noted that the trends over time in the five countries have been rather different (see Atkinson and Micklewright, 1992, Chapter 5), so that the conclusions may differ for this reason for those reached in earlier studies.

Our results for the mid-1980s confirm the earlier finding that income inequality in Czechoslovakia is substantially less than in the UK. The Gini coefficient is some ten percentage points less, and the decile ratio is 2.4 compared with 3.9. Put another way, if the price of economic progress in Czechoslovakia is a fall in the share of the bottom 10 percent to that in the UK, then an increase of 40 percent in real average income is necessary for the lowest 10 percent simply to maintain their absolute level of income.

At the same time, our findings bring out the differences, not just between East and West, but also *within Eastern Europe*. The distribution for Hungary appears relatively close to that in Czechoslovakia: the share of the bottom 10 percent is the same, and the Gini coefficient in Hungary is only 1 percentage point higher. But the Lorenz curves for these two countries lie comfortably inside those for Poland and the former USSR. The Gini coefficients for these latter two countries are some 4-5 percentage points higher. So that, while we find the recorded degree of inequality to be less in all four countries than in the UK, they should not be regarded as identical.

The above summarises briefly *what the statistics show* about the distribution of household income in Eastern Europe. The italicised phrase is important, since we have emphasised the shortcomings of the statistical data in both Eastern Europe and the United Kingdom. We should also stress the problems of interpretation which surround the concept of income in Eastern Europe, notably those that arise in an economy where goods are rationed (this aspect is discussed further in Atkinson and Micklewright, 1992.)

Table 1

Sources of data on the distribution of income used in this chapter

	Type of Source (last year prior to 1990)	Response in last year prior to 1990 and achieved sample size	Income Concept	Presentation of Results in Statistical Yearbook
Czechoslovakia	periodic microcensus of non-institutional population (1988)	96.6% in 1989 (1988 incomes), about 100,000 households	annual net per capita income excluding agricultural income in kind	summary table in yearbook (e.g. Statisticka Rocenka, 1990, p.558)
Hungary	five-yearly income survey of non-institutional population (1987)	83.1% in 1988 (1987 incomes) about 20,000 households	annual net income (total household, per capita, or equivalised) including agricultural income in kind	summary table in yearbook (e.g. Statistical Yearbook, 1988, pp.433-5)
Poland	annual budget survey of non-institutional population (excluding households of non-agricultural private sector workers) (1989)	58.4% in 1989 among households selected for first participation (substitution of non-respondents) about 30,000 households	annual net per capita income including income in kind	summary table in yearbook for 4 household types (e.g. Rocznik Statystyczny, 1989, Table 19(233))
USSR	annual budget survey of households of workers in socialised sector (1989)	response unknown about 92,000 families in 1989	annual net per capita income including agricultural income in kind	summary table in yearbook (e.g. Narodnoe Khoziaistvo, 1989, p.89)
United Kingdom	annual budget survey of non-institutional population (FES) (1989)	73% in 1989 about 7,500 households	gross and net income collected for a variety of periods	no summary table of FES distribution in Annual Abstract of Statistics

Table 2 Summary of income distribution in 1982-5

Individual distribution of household per capita income.

	P_{10}	P_{25}	P_{75}	P_{90}	P_{95}	P_{90}/P_{10}
Czechoslovakia 1985	66.4	81.4	127.1	160.3	182.9	2.41
Hungary 1982	62.0	79.5	128.6	162.1	187.8	2.61
Poland 1985	57.6	75.0	134.2	175.1	209.2	3.04
USSR 1985	53.7	74.3	135.3	177.3	206.9	3.30
United Kingdom 1985	52.0	71.8	144.5	200.9	248.7	3.86

Cumulative Decile Shares:

	S_{10}	S_{20}	S_{30}	S_{40}	S_{50}	S_{60}	S_{70}	S_{80}	S_{90}	S_{95}
Czechoslovakia 1985	4.9	11.6	19.2	27.4	36.3	46.0	56.6	68.4	82.1	90.0
Hungary 1982	4.9	11.3	18.6	26.7	35.6	45.3	56.0	67.9	81.4	89.4
Poland 1985	4.2	9.9	16.6	24.2	32.7	42.1	52.7	64.7	78.8	87.4
USSR 1985	3.9	9.4	16.1	23.7	32.2	41.8	52.6	64.9	79.4	88.0
United Kingdom 1985	3.5	8.6	14.7	21.7	29.7	38.8	49.2	61.5	76.5	85.9

Sources: Atkinson and Micklewright (1992), Statistical Appendix Tables CSI1(continued), CSI2, HI1, HI2, PI1, PI2, UI1, UI2, BI3. Interpolation using INEQ program written by F A Cowell.

Table 3 Measures of income inequality

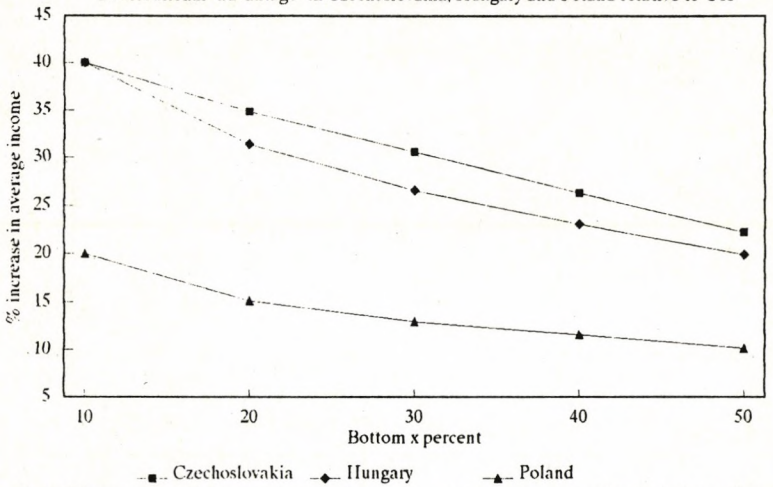
	Gini	RHI	HIM	Estimated variance of logarithms
Czechoslovakia 1985	19.9	13.9	1.76	0.113
Hungary 1982	20.9	15.0	1.82	0.132
Poland 1985	25.3	17.8	2.06	0.185
USSR 1985	25.6	18.2	2.08	0.210
United Kingdom 1985	29.7	21.2	2.74	0.268

Source: see Table 2.

Notes:
(a) RHI is the "Robin Hood Index" and measures the proportion of the income of those above the mean that would have to be redistributed to bring about equal income.
(b) HIM is the "Hungarian Inequality Measure" and is the ratio of the average incomes of those above the mean to the average income of those below the mean.
(c) See text for description of method used to estimate variance of logarithms.

Figure 1

Distributional "advantage" in Czechoslovakia, Hungary and Poland relative to UK



Note: Diagram shows % increase in mean income necessary to compensate for rise in inequality.
Source: Table 2.

Bibliography

Aitchison, J. and Brown, J.A.C. (1957). *The Lognormal Distribution.* Cambridge: Cambridge University Press.

Alexeev M.V. and Gaddy, C.G. (1991) Trends in Wage and Income Distribution under Gorbachev: Analysis of New Soviet Data, Berkeley-Duke Occasional Papers on the Second Economy in the USSR, paper 25, Duke University, Durham NC.

Atkinson, A.B. and Micklewright, J. (1983) On the Reliability of Income Data in the Family Expenditure Survey 1970-77. *Journal of the Royal Statistical Society*, Series A, 146, pp. 33-61.

Atkinson, A B, and Micklewright, J. (1992) *Economic Transformation in Eastern Europe and the Distribution of Income*. Cambridge; Cambridge University Press.

Bergson, A. (1984) Income Inequality under Soviet Socialism. *Journal of Economic Literature*, 22, pp. 1052-1099.

Boldyreva, T. (1989) Columns of figures or an instrument of social policy? *Problems of Economics*, 32, pp. 89-102.

Bruinooge, G., Eltetö, Ö., Fajth, G. and Grubben, G. (1990) Income Distributions in an international perspective - The case of Hungary and the Netherlands. *Statistical Journal of the United Nations*, 7, pp. 39-53.

Central Statistical Office. (1989). *Family Expenditure Survey 1988*. London: HMSO.

Ellman, M. (1990) A note on the distribution of income in the USSR under Gorbachev. *Soviet Studies*, 42, pp. 147-148.

Eltetö, Ö. and Frigyes, E. (1968) New Income Inequality Measures as Efficient Tools for Causal Analysis and Planning. *Econometrica*, 36, pp. 383-396.

Eltetö, Ö. and Vita, L. (1989) A Micro-Simulation Experiment for the Estimation of the Possible Effect of Incomes from the Underground Economy on

the Income Distribution: Methods and Results, 47th Session of the International Statistical Institute, Paris, August 29-September 6, 1989.

Grossman, G. (1987) Roots of Gorbachev's problems; private income and outlay in the late 1970s. In *Gorbachev's Economic Plans*, US Congress Joint Economic Committee, Washington, DC.

Hart, P.E. (1978) Redundant inequalities. National Institute of Economic and Social Research Discussion Paper 18.

Hart, P.E. (1981) The Statics and Dynamics of Income Distributions: a Survey. In *The Statics and Dynamics of Income* (ed. N.A. Klevmarken and J.A. Lybeck), pp. 1-20. Clevedon: Tieto.

Hungarian Central Statistical Office (1975) *Hungarian Survey on Relative Income Differences*. Budapest; KSH.

Lydall, H.F. (1979) Some Problems in Making International Comparisons of Inequality. In *Income Inequality: Trends and International Comparisons* (ed. J.R. Moroney), pp. Lexington, Mass; D C Heath.

Matthews, M. (1978) *Privilege in the Soviet Union*. London; Allen and Unwin.

McAuley, A.N.D. (1979) *Economic Welfare in the Soviet Union*. Madison; University of Wisconsin Press.

Morrisson, C. (1984) Income distribution in East European and Western Countries. *Journal of Comparative Economics*, 8, pp. 121-138.

Nolan, B. (1987) *Income Distribution and the Macroeconomy*. Cambridge; Cambridge University Press.

Pryor, F.L. (1973) *Property and Industrial Organization in Communist and Capitalist Nations*. Bloomington; Indiana University Press.

Royal Commission on the Distribution of Income and Wealth. (1979) *Fifth Report on the Standing Reference*. London; HMSO.

Shenfield, S. (1984). *The Mathematical-Statistical Methodology of the Contemporary Soviet Family Budget Survey.* Ph D thesis, Faculty of Commerce and Social Science, University of Birmingham.

Shenfield, S. and Hanson, P. (1986) The Functioning of the Soviet System of State Statistics (Findings from Interviews with Former Soviet Statistical Personnel), CREES Special Report SR-86-1, Centre for Russian and East European Studies, University of Birmingham.

Treml, V.G. (1990) Note on the Unrepresentativeness of the Goskomstat Household Budget Survey, unpublished research memorandum for the Berkeley-Duke Project on the Second Economy in the USSR, Department of Economics, Duke University, Durham, NC.

UN Economic Commission for Europe (1967) *Incomes in Postwar Europe: A Study of Policies, Growth and Redistribution.* Geneva; United Nations.

Wiles, P.J.D. (1978) Our Shaky Data Base. In *Personal Income Distribution* (ed. W. Krelle and A.F. Shorrocks), pp. 167-192. Amsterdam; North-Holland.

EUI WORKING PAPERS

EUI Working Papers are published and distributed by the
European University Institute, Florence

Copies can be obtained free of charge – depending on the availability of stocks – from:

The Publications Officer
European University Institute
Badia Fiesolana
I-50016 San Domenico di Fiesole (FI)
Italy

Please use order form overleaf

Publications of the European University Institute

Economics Department Working Paper Series

To Economics Department **WP**
European University Institute
Badia Fiesolana
I-50016 San Domenico di Fiesole (FI)
Italy

From Name .....

Address. .....
.....
.....
.....
.....
(Please print)

❒ Please enter/confirm my name on EUI Economics Dept. Mailing List
❒ Please send me a complete list of EUI Working Papers
❒ Please send me a complete list of EUI book publications
❒ Please send me the EUI brochure Academic Year 1992/93

Please send me the following EUI **ECO** Working Paper(s):

No, Author .....
Title: .....
No, Author .....
Title: .....
No, Author .....
Title: .....
No, Author .....
Title: .....

Date ..... Signature .....

Working Papers of the Department of Economics Published since 1990

ECO No. 90/1
Tamer BASAR and Mark SALMON
Credibility and the Value of Information Transmission in a Model of Monetary Policy and Inflation

ECO No. 90/2
Horst UNGERER
The EMS – The First Ten Years
Policies – Developments – Evolution

ECO No. 90/3
Peter J. HAMMOND
Interpersonal Comparisons of Utility: Why and how they are and should be made

ECO No. 90/4
Peter J. HAMMOND
A Revelation Principle for (Boundedly) Bayesian Rationalizable Strategies

ECO No. 90/5
Peter J. HAMMOND
Independence of Irrelevant Interpersonal Comparisons

ECO No. 90/6
Hal R. VARIAN
A Solution to the Problem of Externalities and Public Goods when Agents are Well-Informed

ECO No. 90/7
Hal R. VARIAN
Sequential Provision of Public Goods

ECO No. 90/8
T. BRIANZA, L. PHLIPS and J.F. RICHARD
Futures Markets, Speculation and Monopoly Pricing

ECO No. 90/9
Anthony B. ATKINSON/ John MICKLEWRIGHT
Unemployment Compensation and Labour Market Transition: A Critical Review

ECO No. 90/10
Peter J. HAMMOND
The Role of Information in Economics

ECO No. 90/11
Nicos M. CHRISTODOULAKIS
Debt Dynamics in a Small Open Economy

ECO No. 90/12
Stephen C. SMITH
On the Economic Rationale for Codetermination Law

ECO No. 90/13
Elettra AGLIARDI
Learning by Doing and Market Structures

ECO No. 90/14
Peter J. HAMMOND
Intertemporal Objectives

ECO No. 90/15
Andrew EVANS/Stephen MARTIN
Socially Acceptable Distortion of Competition: EC Policy on State Aid

ECO No. 90/16
Stephen MARTIN
Fringe Size and Cartel Stability

ECO No. 90/17
John MICKLEWRIGHT
Why Do Less Than a Quarter of the Unemployed in Britain Receive Unemployment Insurance?

ECO No. 90/18
Mrudula A. PATEL
Optimal Life Cycle Saving With Borrowing Constraints: A Graphical Solution

ECO No. 90/19
Peter J. HAMMOND
Money Metric Measures of Individual and Social Welfare Allowing for Environmental Externalities

ECO No. 90/20
Louis PHLIPS/
Ronald M. HARSTAD
Oligopolistic Manipulation of Spot Markets and the Timing of Futures Market Speculation

* Working Paper out of print

ECO No. 90/21
Christian DUSTMANN
Earnings Adjustment of Temporary Migrants

ECO No. 90/22
John MICKLEWRIGHT
The Reform of Unemployment Compensation:
Choices for East and West

ECO No. 90/23
Joerg MAYER
U. S. Dollar and Deutschmark as Reserve Assets

ECO No. 90/24
Sheila MARNIE
Labour Market Reform in the USSR: Fact or Fiction?

ECO No. 90/25
Peter JENSEN/
Niels WESTERGÅRD-NIELSEN
Temporary Layoffs and the Duration of Unemployment: An Empirical Analysis

ECO No. 90/26
Stephan L. KALB
Market-Led Approaches to European Monetary Union in the Light of a Legal Restrictions Theory of Money

ECO No. 90/27
Robert J. WALDMANN
Implausible Results or Implausible Data? Anomalies in the Construction of Value Added Data and Implications for Estimates of Price-Cost Markups

ECO No. 90/28
Stephen MARTIN
Periodic Model Changes in Oligopoly

ECO No. 90/29
Nicos CHRISTODOULAKIS/
Martin WEALE
Imperfect Competition in an Open Economy

***

ECO No. 91/30
Steve ALPERN/Dennis J. SNOWER
Unemployment Through 'Learning From Experience'

ECO No. 91/31
David M. PRESCOTT/Thanasis STENGOS
Testing for Forecastible Nonlinear Dependence in Weekly Gold Rates of Return

ECO No. 91/32
Peter J. HAMMOND
Harsanyi's Utilitarian Theorem:
A Simpler Proof and Some Ethical Connotations

ECO No. 91/33
Anthony B. ATKINSON/
John MICKLEWRIGHT
Economic Transformation in Eastern Europe and the Distribution of Income

ECO No. 91/34
Svend ALBAEK
On Nash and Stackelberg Equilibria when Costs are Private Information

ECO No. 91/35
Stephen MARTIN
Private and Social Incentives to Form R & D Joint Ventures

ECO No. 91/36
Louis PHLIPS
Manipulation of Crude Oil Futures

ECO No. 91/37
Xavier CALSAMIGLIA/Alan KIRMAN
A Unique Informationally Efficient and Decentralized Mechanism With Fair Outcomes

ECO No. 91/38
George S. ALOGOSKOUFIS/
Thanasis STENGOS
Testing for Nonlinear Dynamics in Historical Unemployment Series

ECO No. 91/39
Peter J. HAMMOND
The Moral Status of Profits and Other Rewards:
A Perspective From Modern Welfare Economics

* Working Paper out of print

ECO No. 91/40
Vincent BROUSSEAU/Alan KIRMAN
The Dynamics of Learning in Mis-Specified Models

ECO No. 91/41
Robert James WALDMANN
Assessing the Relative Sizes of Industry- and Nation Specific Shocks to Output

ECO No. 91/42
Thorsten HENS/Alan KIRMAN/Louis PHLIPS
Exchange Rates and Oligopoly

ECO No. 91/43
Peter J. HAMMOND
Consequentialist Decision Theory and Utilitarian Ethics

ECO No. 91/44
Stephen MARTIN
Endogenous Firm Efficiency in a Cournot Principal-Agent Model

ECO No. 91/45
Svend ALBAEK
Upstream or Downstream Information Sharing?

ECO No. 91/46
Thomas H. McCURDY/
Thanasis STENGOS
A Comparison of Risk-Premium Forecasts Implied by Parametric Versus Nonparametric Conditional Mean Estimators

ECO No. 91/47
Christian DUSTMANN
Temporary Migration and the Investment into Human Capital

ECO No. 91/48
Jean-Daniel GUIGOU
Should Bankruptcy Proceedings be Initiated by a Mixed Creditor/Shareholder?

ECO No. 91/49
Nick VRIEND
Market-Making and Decentralized Trade

ECO No. 91/50
Jeffrey L. COLES/Peter J. HAMMOND
Walrasian Equilibrium without Survival: Existence, Efficiency, and Remedial Policy

ECO No. 91/51
Frank CRITCHLEY/Paul MARRIOTT/
Mark SALMON
Preferred Point Geometry and Statistical Manifolds

ECO No. 91/52
Costanza TORRICELLI
The Influence of Futures on Spot Price Volatility in a Model for a Storable Commodity

ECO No. 91/53
Frank CRITCHLEY/Paul MARRIOTT/
Mark SALMON
Preferred Point Geometry and the Local Differential Geometry of the Kullback-Leibler Divergence

ECO No. 91/54
Peter MØLLGAARD/
Louis PHLIPS
Oil Futures and Strategic Stocks at Sea

ECO No. 91/55
Christian DUSTMANN/
John MICKLEWRIGHT
Benefits, Incentives and Uncertainty

ECO No. 91/56
John MICKLEWRIGHT/
Gianna GIANNELLI
Why do Women Married to Unemployed Men have Low Participation Rates?

ECO No. 91/57
John MICKLEWRIGHT
Income Support for the Unemployed in Hungary

ECO No. 91/58
Fabio CANOVA
Detrending and Business Cycle Facts

ECO No. 91/59
Fabio CANOVA/
Jane MARRINAN
Reconciling the Term Structure of Interest Rates with the Consumption Based ICAP Model

ECO No. 91/60
John FINGLETON
Inventory Holdings by a Monopolist Middleman

* Working Paper out of print

ECO No. 92/61
Sara CONNOLLY/John MICKLEWRIGHT/Stephen NICKELL
The Occupational Success of Young Men Who Left School at Sixteen

ECO No. 92/62
Pier Luigi SACCO
Noise Traders Permanence in Stock Markets: A Tâtonnement Approach. I: Informational Dynamics for the Two-Dimensional Case

ECO No. 92/63
Robert J. WALDMANN
Asymmetric Oligopolies

ECO No. 92/64
Robert J. WALDMANN /Stephen C. SMITH
A Partial Solution to the Financial Risk and Perverse Response Problems of Labour-Managed Firms: Industry-Average Performance Bonds

ECO No. 92/65
Agustín MARAVALL/Víctor GÓMEZ
Signal Extraction in ARIMA Time Series Program SEATS

ECO No. 92/66
Luigi BRIGHI
A Note on the Demand Theory of the Weak Axioms

ECO No. 92/67
Nikolaos GEORGANTZIS
The Effect of Mergers on Potential Competition under Economies or Diseconomies of Joint Production

ECO No. 92/68
Robert J. WALDMANN/ J. Bradford DE LONG
Interpreting Procyclical Productivity: Evidence from a Cross-Nation Cross-Industry Panel

ECO No. 92/69
Christian DUSTMANN/John MICKLEWRIGHT
Means-Tested Unemployment Benefit and Family Labour Supply: A Dynamic Analysis

ECO No. 92/70
Fabio CANOVA/Bruce E. HANSEN
Are Seasonal Patterns Constant Over Time? A Test for Seasonal Stability

ECO No. 92/71
Alessandra PELLONI
Long-Run Consequences of Finite Exchange Rate Bubbles

ECO No. 92/72
Jane MARRINAN
The Effects of Government Spending on Saving and Investment in an Open Economy

ECO No. 92/73
Fabio CANOVA and Jane MARRINAN
Profits, Risk and Uncertainty in Foreign Exchange Markets

ECO No. 92/74
Louis PHLIPS
Basing Point Pricing, Competition and Market Integration

ECO No. 92/75
Stephen MARTIN
Economic Efficiency and Concentration: Are Mergers a Fitting Response?

ECO No. 92/76
Luisa ZANCHI
The Inter-Industry Wage Structure: Empirical Evidence for Germany and a Comparison With the U.S. and Sweden

ECO NO. 92/77
Agustín MARAVALL
Stochastic Linear Trends: Models and Estimators

ECO No. 92/78
Fabio CANOVA
Three Tests for the Existence of Cycles in Time Series

ECO No. 92/79
Peter J. HAMMOND/Jaime SEMPERE
Limits to the Potential Gains from Market Integration and Other Supply-Side Policies

* Working Paper out of print

ECO No. 92/80
Víctor GÓMEZ and Agustín MARAVALL
Estimation, Prediction and Interpolation for Nonstationary Series with the Kalman Filter

ECO No. 92/81
Víctor GÓMEZ and Agustín MARAVALL
Time Series Regression with ARIMA Noise and Missing Observations Program TRAM

ECO No. 92/82
J. Bradford DE LONG/ Marco BECHT
"Excess Volatility" and the German Stock Market, 1876-1990

ECO No. 92/83
Alan KIRMAN/Louis PHLIPS
Exchange Rate Pass-Through and Market Structure

ECO No. 92/84
Christian DUSTMANN
Migration, Savings and Uncertainty

ECO No. 92/85
J. Bradford DE LONG
Productivity Growth and Machinery Investment: A Long-Run Look, 1870-1980

ECO NO. 92/86
Robert B. BARSKY and J. Bradford DE LONG
Why Does the Stock Market Fluctuate?

ECO NO. 92/87
Anthony B. ATKINSON/John MICKLEWRIGHT
The Distribution of Income in Eastern Europe

* Working Paper out of print